Claims:

1. A method comprising effecting electroporation by displacing a sample across electric field lines of a spatially inhomogeneous electric field while the field is substantially constant in terms of magnitude.

2. The method of claim 1, the electric field being established by electrodes coupled to a DC source.

3. The method of claim 1, the electric field being established by electrodes coupled to an AC source.

4. The method of claim 1, the electric field being established by electrodes having a peak power consumption not exceeding 150% of an average power consumption.

5. The method of claim 4, where the peak and average power consumption are less than about 10 Watts.

6. The method of claim 1, the electric field being established by electrodes having a duty cycle greater than 50%.

7. A method for electroporating a sample, the method comprising:

generating a spatially inhomogeneous electric field with a pair of electrodes; and

displacing the pair of electrodes and a sample relative to one other while the electric field is substantially constant in terms of magnitude so that the sample is displaced across electric field lines for a time sufficient to effect electroporation.

8. The method of claim 7, where the electrode is fixed and the sample is displaced.

9. The method of claim 7, where the sample is fixed and the electrode is displaced.

10. The method of claim 7, where the sample and electrode are both displaced.

11. The method of claim 7, where the electrode is continuously energized by a DC source of approximately 100 to 150 volts.

12. The method of claim 7, where the electrode is continuously energized by an AC source of approximately 100 to 150 volts and a frequency of approximately 10 to 60 Hertz.

13. The method of claim 12, where the AC source is accessed directly through a standard electrical wall outlet.

14. The method of claim 7, the electrode having a peak power consumption not exceeding 150% of an average power consumption.

15. The method of claim 14, where the peak and average power consumption are less than about 10 Watts.

16. The method of claim 7, the electrode having a duty cycle greater than 50%.

17. An electroporation apparatus comprising:

a channel configured to contain a flow of particles;

an inlet in fluid communication with the channel;

an outlet in fluid communication with the channel; and

a pair of electrodes adjacent the channel that generate within the flow channel a spatially inhomogeneous electric field that temporarily exposes the particles flowing through the channel to effect electroporation.

18. The apparatus of claim 17, the channel being wall-less and comprising hydrophobic and hydrophilic regions.

19. The apparatus of claim 17, the electrodes having a peak power consumption not exceeding 150% of an average power consumption.

20. The apparatus of claim 19, where the peak and average power consumption are less than about 10 Watts.

21. The apparatus of claim 17, where the electrodes have a duty cycle greater than 50%.

22. The apparatus of claim 17, further comprising a separate cooling element in operative relation with the channel.

23. The apparatus of claim 17, further comprising flow shunts in operative relation with the channel.

24. An apparatus for electroporating a sample, the apparatus comprising:

a pair of electrodes; and

a controller configured to displace a sample relative to one or both of the electrodes while the electrodes are continuously energized so that the sample is displaced across electric field lines for a time during which exposure to the electric field is sufficient to effect electroporation.

25. The apparatus of claim 24, where the controller comprises a computer configured to establish a flow rate of the sample.

26. The apparatus of claim 24, where the controller comprises a computer configured to displace one or both of the electrodes.

27. The apparatus of claim 24, the electrodes having a peak power consumption not exceeding 150% of an average power consumption.

28. The apparatus of claim 27, where the peak and average power consumption are less than about 10 Watts.

29. The apparatus of claim 24, where the electrodes have a duty cycle greater than 50%.

30. The apparatus of claim 24, further comprising a separate cooling element configured to cool the sample during or following electroporation.

31. A flow-electroporation chamber comprising electrodes having a peak power consumption not exceeding 150% of an average power consumption.

32. The flow-electroporation chamber of claim 31, where the peak and average power consumption are less than about 10 Watts.

33. A flow-electroporation chamber comprising electrodes having a duty cycle greater than 50%.